

AVIARY DESIGN AND MANUFACTURE

By Bob Cleaver

The diatribe that follows is an expanded version of the presentation given at the Avicultural Society of South Australia's General Meeting held on the 15th of August 2000. Due to time constraints, most of the manufacturing section of this article was not covered that evening.

DESIGN

The design of any aviary is very much dependent on what you are intending to keep and you will have to keep this in mind at all times.

Having said that there are three main points you should consider regardless of what you are going to house.

Shape - Orientation - Materials

1. Shape

Should it be :

- i.** Long and narrow ? - for Parrots
- ii.** Square ? - probably more suited to finches and softbills
- iii.** How High?
- iv.** Doors?
- v.** Roof?

1(i, ii) Basically the shape of your aviary can be anything you like. If you have a corner of your garden that is useless for any other purpose, consider an aviary. You don't necessarily have to make space in your back yard to fit an aviary, make the aviary to fit the space. It does not have to be a rectangle, in fact its size and shape is only bounded by the space available to you and the size of your wallet. I have a friend in the Riverland who has built an aviary that is **60m square and 7m** high at the centre. The roof and walls are all shade cloth and the supports are steel with flat padded plates at the top and the whole thing is stretched over steel rope tensioned with turnbuckles. But I am digressing.

It is probably not a bad idea to get away from the convention of cuboid aviaries as it can make for interesting shapes but it will become

problematical if you want a bank of aviaries – then obviously rectangles are much more practical. It is entirely up to you!

So you have now decided what shape you want and where you're going to put it. The next thing to consider is :-

1(iii) Height

This is very important, even more so than the width or depth. I believe it should be higher than you by at least 300 to 400mm, so when you walk in the aviary the birds can fly over your head, in fact the higher the better. Most of my aviaries are between 2 and 3m. This also makes for easier catching and remember when designing the internal fittings of your aviary always leave yourself room to be able to walk about with a net in your hand without stumbling over things. (Digressing again for a moment - there is a knack to catching birds, particularly in a long flight and that is to wait until the bird is by your side or has passed you before you attempt to net it – don't try to net it flying towards you as you will probably miss or hit the bird with the ring of the net.)

The alternative to catching with a net is to provide a place to trap your birds within the aviary. For example an old budgie cage into which you place their tucker and arrange it so you can close the door from outside the aviary. If you to get a little more sophisticated you can make up a small cage to hang on the wall of your aviary, either inside or out whichever is the more appropriate for your set-up. I am currently using this method with the small cage outside the confines of the aviary – it's actually inside an adjacent shed. I made my cages using two cage fronts, which can be bought from any reputable bird dealer, one on the aviary side and the other accessible from outside. Obviously on the inside the door remains open and the other for you to have access for feeding. The birds will be quite happy to hop into this cage to feed and you will be able to trap them when required. If you are going to make one of these it's a good idea to use the inside cage front upside down so that the door can't drop shut accidentally.

That leads us nicely into :-

1(iv) Doors.

Doors are often overlooked but in fact they are one of the most vital parts of your design. One of my pet hates is aviaries with small doors. I much prefer large doors. There is nothing worse than trying to struggle into an aviary with an armful of gum branches through a tiny doorway, By the time you have squeezed through and then closed the door behind you half your

birds have gone! The doors on my aviaries are generally not less than 1700mm x 600mm with a 200mm kickpanel underneath. I can honestly say that I have never lost a bird because the door was too large but I have lost them through small doors.

The secret with large doors is to have a wire section above the door and below the aviary roof. (Another reason the aviary should have plenty of height.) One suggestion that was brought forward at the ASSA meeting, which I believe is a brilliant idea and was something new to me (we never stop learning), and that is to place a horizontal wire platform inside the aviary above the door. Then if the birds do fly towards the door and try to negotiate the opening, this panel would be enough slow them up and hopefully give you enough time to get the door closed.

Which way do you want the door to open?

Once again my preference is for the door to open outward, (I always have built-in doorstops on the inside of the doorway so the door cannot swing inward). I also use pad bolts both inside and out. This leaves more usable space inside the aviary and I believe is less likely to cause the birds to dive for an opening.

Positioning of the door is also important and is going to be a little difficult to try to describe in writing but I'll give it a go. If the door is on the end of an aviary at the farthest point from the covered end, which is the most common place to put it, it's not going to matter a great deal which way it opens but if you put it on the side it should be hinged so that the hinge side is away from where your birds spend most of their time. If the door is placed in the covered end, when you open it the birds are going to fly down to the open end of the aviary and again it won't matter which way it's hinged. However, I don't like surprising my birds by walking through, what was to them a few minutes before, a blank wall, so if you do have the door at the covered end make it from some type of see through material or make lots of noise before you enter.

You can alleviate the problems of escapees if you: -

Consider a safety door system.

This can be in the form of an 'airlock' with two doors close together. They can be opposite or adjacent to one another and can be either outside or inside the aviary. The outside door should open out and the inside door to open in (preferably against the side not into the body of the aviary)

Another safety door system is to have a corridor running along the length of a bank of aviaries with all the aviary doors opening into the corridor and only one door opening to the outside world.

1(v) Roofs

Another of my pet hates – aviaries with a fully covered roof. All birds enjoy rain at some time or another. I believe you should have at least a third uncovered, preferably half, perhaps even three-quarters, a lot will depend on the size of the aviary, but they must have access to sun and rain. By all means provide them with plenty of shelter, which you will need to do to be able to keep the feed dry, but please let them have access to rain and sun and wind. You will breed much hardier birds this way. I live in hot part of the world (in summertime we have long periods of mid forties) and some of my aviaries have very little cover at all. Its main use is shade and wind protection. On some of them the walls don't go right down the floor to allow air movement at ground level.

Which brings me to: -

2. Orientation.

Some people say always align your aviaries **East/West or North/South** or some other compass bearing – **forget it!!**

Every back yard has its own mini ecosystem and is different from your neighbour over the road. Look at your own situation and arrange your aviary, if possible, to collect the early morning sun, be protected from the hot afternoon sun and from the worst of the winter wind and rain. It's a bit of a tall order but it is possible and it is not all in the orientation. You can make use of existing structures or trees for shade and shelter. If you are finding that the rain is blowing into the back of you aviary you could arrange a vertical solid section at the entrance to the covered end but make it, if possible, from a see through material (not clear) – birds will not fly into a dark area. The alternative is to have a skylight in the covered end.

Pests

Another question that came up several times at the Avicultural Society meeting was the question of mice – “How can you build an aviary to keep them out?” The simple answer is you can't. I do not know **any** aviculturalist that keeps seed eating birds that doesn't have, or hasn't had, a mouse problem at some stage.

You could possibly design and build a mouse proof aviary by using the following suggestions but there are no guarantees – they will eventually find there way in somehow.

Mice will get through ½” mesh, or at least young ones will and then they grow up and can’t get out. The alternative is to use what is known as ‘mouse and snake wire’ which is ¼” mesh, but it is very expensive and what do you do about the solid sections of your aviary? Do you bung up all the holes or do you use flat sheet material? Then what do you do about the floor? Do you use mouse wire again (and wait for it to rot) or do you go to the expense and hard labour of concrete. If you’re keeping parrots they will probably chew holes in the mouse wire (it’s only 0.6mm gauge). It’s all starting to get too hard!

There are some simple things you can do that don’t involve a lot of work or expense. First and foremost, have a regular poisoning programme. There are many ways in which you can bait an aviary without worrying about the birds. You can use a bait box (purchasable at Avicultural Society meetings), a very cheap and simple method is an ice cream container with a couple small holes cut in the side then placed upside-down over a smaller container with poison in it and a brick on top to hold it down.

Another trick, if you have the space, is to make sure your aviary has a cleared area all around it, preferably something solid like a concrete apron, pavers or paving slabs. Make it so the mice have to cross a reasonably wide-open space before they get to the aviary – they don’t like it and will avoid it if possible. Also keep water away from the outside of the aviaries – under normal conditions mice won’t travel more than about 10m from a water supply. Obviously you have got to have water inside the aviaries but keep it well away on the outside (no dripping taps, pot plants with saucers, ponds, leaky hoses, dripper systems, etc. etc. I realise some of these suggestions are not very practical but they will help.

So what sorts of materials are you going to use to build this fantastic avian Hilton?

3. Materials -

- i. Timber**
- ii. Steel**
- iii. Meshes**
- iv. or a combination**

3(i). Timber

Not a lot of choice with timber – probably treated pine is the best but don't house 'flying bolt cutters' in such an aviary otherwise you'll have no aviary left and probably a dead bird or two. Although having said that, I have built aviaries for the smaller parrots using permapine and they served me very well for a lot of years and they look attractive. But very difficult to dismantle if you have to move and they require more maintenance than steel. Permapine tends to move a lot – it will expand and twist when it gets wet and will do the reverse when it dries out. I have seen 4" twisted galvanised roofing nails work their way out by as much as an inch or so over quite a short period of time (basically two seasons).

The more traditional choices would be: -

3(ii) Steel

I mostly use 20mm x 20mm x 1.6mm square galvanised tube (or sometimes 25mm x 25mm x 1.6mm) welded together to make a frame. I'll discuss this in more detail later under the heading of construction. Alternatives are angle, C channel or round tube.

3(iii) Meshes

Mesh type and size.

There are myriad different types of aviary meshes available but the basics are the **chicken wire** types and the **welded meshes**.

If I am building an aviary to sell I would always use an Australian manufactured weldmesh but I have and do use chicken wire on large '*in situ*' aviaries of my own, particularly for birds of prey. It is much 'softer' and they seem do themselves far less damage. I would actually prefer to see these types of birds behind aviaries of vine netting for at least the roof and half way down the sides, but you do really need wire or some form of solid material for, at least, the bottom half of the walls simply for mechanical protection from outside.

3(iv) Combination

Here the choices are up to you – use whatever suitable materials you have at hand. You could have steel posts (for termite protection) with timber at roof height – particularly if you want to have a shade cloth roof. It's much easier to attach shade cloth to timber rather than to steel. I

mentioned earlier about a 60m square aviary made of shade cloth and I thought you might be interested in how it was fixed at ground level. It was a very simple but very effective idea. Basically a trench was dug all around the perimeter of the aviary 1m deep and 1m across the ends of the shade cloth were placed into the trench and it was then backfilled. It is never going to move – believe me!! The only weakness in the whole structure is where the support pillars meet the roof and is starting to show signs of wear at these points after quite a lot of years of good service.

Miscellaneous.

Don't over-perch your aviaries – leave room for the birds to fly or don't clutter the floor if they're ground dwellers.

Make sure the feeding stations are out of the weather.

Make sure the feeding stations are out of reach of ants and mice (this is not so easy and could be the subject of an article on its own).

Make sure the water is out of the sun – particularly in summer.

Try recreating the environment of the species you are going to house – again this is a tall order but it is possible with some species.

e.g. For water or wading birds you could have a couple of shallow ponds with a stream running between them.

For desert species you could have lots of sand (not bricklayers sand but washed sand), rocks, tussock grass etc.

These are only some ideas for you to think about when designing an aviary and there will be many more but I hope I have covered the basics. Please use your imagination, look at other peoples ideas and adapt them, talk to as many aviculturalists as you can for more ideas but never forget that the comfort of the inhabitants is the prime objective and preferably put all your ideas down on paper before you start.

CONSTRUCTION

After you have worked out the size and shape of your aviary there are several methods of construction.

The first question you must ask yourself is - **is this aviary a fixture** or am I going to want to move it sometime in the future? You may decide to move house in ten years time and if you make your aviary as a fixture you'll have to start again (not always a bad thing), but if you want to take

your aviary with you then you could use the method I have adopted and make it in panel form.

My aviaries are generally constructed as bolt together panels using 20mm x 20mm x 1.6mm galvanised square steel tube, Australian manufactured Weldmesh and Lo-rib zincalume (or Colourbond) solid sections. The wire is attached to the galvanised square steel tube (or frame) with aluminium rivets and then covered with a galvanised steel strip attached with Tek screws. On the wire panels there will be a kick panel at ground level unless otherwise specified.

If you are making a panel type aviary first you will need to cut all your steel to the correct length not forgetting to drill the holes where you are going to bolt each panel together. It's much easier to do it at this stage rather than after you have assembled each panel.

Frame

Weld your lengths of steel together making sure your corners are square. This is critical otherwise the finished product will not fit together. The easiest way to square each panel is to tack-weld the outside pieces first to make a rectangle (or square) then measure corner to corner, clamp and then finish weld. Using this method you don't need a T-square. You can then weld in all your internal pieces.

After you have finished all the welding I find it is a good idea to grind the welds flat and then treat each weld with some kind of cold galv. or killrust otherwise the joint will rust. The reason for grinding the welds flat is that it makes life a lot easier later on when you come to fixing the wire and zincalume in place – also the finished article looks better.

Weld up the whole aviary, panel by panel and then assemble it before you start to attach wire etc. just to make sure it goes together properly. You will be able to make minor adjustments or correct mistakes at this stage which will be much more difficult, if not impossible, later on.

If you are considering a round-topped aviary, this can be done with the wire by its-self (without any frame) if you are using heavy gauge wire or you can bend your steel to suit the arc you need.

Tip – don't try bending 20mm square tube unless you have proper bending equipment – it will twist. Rectangular is much more forgiving. Round is easy but tricky to attach things to.

Wire and Zincalume Sheet

To attach the wire to the frame, and lets assume for arguments sake that we are using weldmesh as it is the most popular product, I generally start in one corner, drill and rivet either side of that corner then use the same procedure at the opposite parallel corner; then repeat the process in the other two corners. Don't try to stretch weldmesh – it doesn't like it and you'll end up with a mess. If you use the method described above you should find it will lay down nice and flat and then you can rivet along each side.

Once you have the wire in place the next step is to attach the steel tapes along the edges to cover the raw ends of the weldmesh. I found the easiest way to do this is to attach one corner first by tek-screwing two strips together into the corner of the frame that are going to run along two adjacent sides. Having done this you will then need a pair of grips of some sort to pull one of these strips tight to the next corner and fix it in place with another strip of galv. tape for the next edge. Repeat this process along all exposed wire edges and then you can attach the zincalume sheet quite simply with Tek-screws.

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